

This listing of claims will replace all prior versions, and listings, of claims in the application.

**Listing of Claims:**

- 1-67. (Canceled)
68. (Previously presented) A method for identifying a candidate compound useful for stimulating chromosome synapsis in a cell, comprising:
- a) contacting MSH5 protein with a test compound;
  - b) determining the meiotic activity of the MSH5 protein in the presence of said test compound;
  - c) selecting a compound that stimulates the meiotic activity of the MSH5 protein; and,
  - d) identifying said selected compound as a candidate compound useful for stimulating chromosome synapsis in a cell.
69. (Previously presented) A method for identifying a candidate compound useful for stimulating chromosome synapsis in a cell, comprising:
- a) contacting a cell expressing an MSH5 gene with a test compound;
  - b) determining the expression of the MSH5 gene or the meiotic activity of MSH5 in the presence of said test compound;
  - c) selecting a compound that stimulates the expression of the MSH5 gene or the meiotic activity of MSH5; and,
  - d) identifying said selected compound as a candidate compound useful for stimulating chromosome synapsis in a cell.
70. (Previously presented) A method for identifying a candidate compound useful for inhibiting chromosome synapsis in a cell, comprising:
- a) contacting MSH5 protein with a test compound;

- b) determining the activity of the MSH5 protein in the presence of said test compound;
- c) selecting a compound that inhibits the meiotic activity of the MSH5 protein; and,
- d) identifying said selected compound as a candidate compound useful for inhibiting chromosome synapsis in a cell.

71. (Previously presented) A method for identifying a candidate compound useful for inhibiting chromosome synapsis in a cell, comprising:

- a) contacting a cell expressing an MSH5 gene with a test compound;
- b) determining the expression of the MSH5 gene or the meiotic activity of MSH5 in the presence of said test compound;
- c) selecting a compound that inhibits the expression of the MSH5 gene or the meiotic activity of MSH5; and,
- d) identifying said selected compound as a candidate compound useful for inhibiting chromosome synapsis in a cell.